

Remarks

Introduction Claims 1 through 18 have been rejected, or objected to, based on 35 U.S.C. § 103 citing Press (US 3,626,365) and Lehmann (US. 6,731,204 B2). The teachings of these patents, and the differences between these patents and the applicant's invention will be described. The steps needed to start with Press and Lehmann and arrive at the applicant's invention will be described. These steps will be seen to be unexpected without hindsight from the applicant's invention.

Similarities between Press, Lehmann, and Applicant Press, Lehmann, and the applicant all teach methods of improving motor vehicle safety. Press and the applicant use directional microphones. Lehmann and the applicant use aural interfaces to the vehicle driver.

Differences between Press and Applicant Press teaches the use of directional microphones to provide a visual warning of a nearby emergency vehicle siren or a horn or other warning sound for people who can not hear sirens or horns. Press processes signals from directional microphones by monitoring them to determine when the signals indicates that a threshold has been reached indicating a nearby warning sound, and warning the driver with lights in a visual display when that threshold has been passed. Press does not provide any warning or other information to the driver until a siren, horn, or similar warning sound has crossed the threshold of an actionable sound. Press processes the information from his directional microphones to prevent any response being given to the driver due to ordinary traffic sounds. All of these characteristics of Press are differences from the applicant.

The applicant teaches the use of directional microphones to reproduce environmental sounds inside a vehicle, thus reducing the aural isolation of the driver inside an inclosed vehicle. The applicant provides environmental sound to the driver continuously without regard to thresholds or without making decisions about whether a sound is actionable. The applicant uses directional microphones in combination with unusual signal processing to improve the quality of reproduced

sounds such that the driver is less aware of sounds produced by his own vehicle. All of these characteristics of the applicant's invention are different from Press.

Differences between Lehmann and Applicant Lehmann collects information with sensors that are more complicated than microphones alone. Lehmann gives examples of possible sensors and he describes the use of backup aid systems as an example of a preceding technology. The only requirement for his sensors is that they can detect objects and measure the directional position of the detected objects relative to the vehicle. Based on Lehmann's examples and description, his sensors must be able to detect silent objects such as a parked car or a building. Microphones alone would not qualify for Lehmann's sensors. Lehmann monitors information from sensors, waiting for an indication that an external object is in an actionable state. Only when the threshold has been crossed to an actionable state does Lehmann begin warning the driver. Lehmann warns the driver with generated sounds that indicate position and perhaps distance to the external item of interest. These generated sounds have nothing to do with what sounds the external object may or may not be making. All these characteristics of Lehmann are different from the applicant.

The applicant makes no attempt to interpret or judge the importance the environmental sounds that are reproduced for the driver's benefit. The applicant continuously provides environmental sounds to the driver. The purpose of reproducing sounds is to make driving a more sensually rich activity and to thus keep the driver's attention on driving his car in traffic. The driver is thus more likely to pay attention to other vehicles in his blind spots and to use his eyes and cognitive abilities to determine what possible actions are safe. All of these characteristics of the applicant's invention are different from Lehmann.

First modification, Transforming Press to Applicant The examiner argues that "The loudspeaker system of Lehmann would be used in place of the warning lamps of Press. The motivation for doing so would have been to audibly warn the driver as to the direction of the obstacles, such as the location of other vehicles on the road." Considering that Press teaches a visual warning of emergency vehicle sirens for people who can not hear sirens, no person with

ordinary common sense would replace the lamps of Press with loudspeakers. The reason that this change violates common sense is that people who can not hear sirens are unlikely to hear Lehmann's loudspeakers. This modification makes Press unsuited for its intended application, warning drivers who can not hear. **Because this modification renders Press unsuited for its intended purpose, it is not evidence of obviousness.** *In re* Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) The only motivation for this modification is hindsight from the applicant's invention.

Second modification, Transforming Press to Applicant The generated sounds taught by Lehmann would need to be replaced by the actual sounds of the emergency vehicle sirens detected by Press. Neither Press nor Lehmann teach or suggest reproducing actual environmental sounds. The one concrete example of a system described by Lehmann is a parking aid, to warn of objects that do not make sounds until hit. Reproducing siren sounds is pointless for Press, which provides an aid to drivers who can not hear sirens. Reproducing siren sounds is pointless for Lehmann because drivers able to use Lehmann's aural interface have no trouble hearing sirens directly The only motivation for this modification is hindsight from the applicant's invention.

Third modification, Transforming Press to Applicant The monitoring of information and waiting for a signal to cross a threshold of actionable interest would need to be abandoned, to provide, as the applicant does, continuous reproductions of environmental sounds to the driver. Both Press and Lehmann teach the opposite, providing the driver with warnings only after a threshold has been reached. Nothing in Press or Lehmann suggests abandoning their monitoring and waiting for a threshold crossing. The only motivation for this modification is hindsight from the applicant's invention.

Forth modification, Transforming Press to Applicant The effort by Press to ignore ordinary traffic sounds would need to be abandoned. Press explicitly teaches the importance of avoiding responses to ordinary traffic sounds. Nothing in Press or Lehmann suggests any value in

responding to ordinary traffic sounds. The only motivation for this modification is hindsight from the applicant's invention.

Fifth modification, Transforming Press to Applicant Specialized signal processing would need to be added. The applicant teaches that specialized and unusual signal processing is needed to enable directional microphones of a size appropriate for use on an automobile to improve the quality of reproduced environmental sounds. This signal processing makes use of the fact that the predominant environmental sounds on a highway are tire noises, and these noises come from both the host vehicle and from nearby vehicles, and tire noise is broad-band noise, having both low and high frequency components. The signal processing called "Level Dependent Filter" in the applicant's specification is an example of this necessary signal processing. Nothing in Press or Lehmann teaches or suggests this signal processing. The only motivation for this signal processing is hindsight from the applicant's invention.

The applicant's combination of unusual signal processing with directional microphones to improve the signal quality of reproduced environmental sounds required more than ordinary skill in the engineering arts.

Summary, Claim 1 The information above shows why the applicant's claim 1 is not obvious to a person of ordinary skill in light of Press and Lehmann. Claim 1 should be allowed.

Claims 2 through 18 Since these claims were rejected, or objected to, based on the rejection of claim 1, they should be allowed.

Claim 20 Claim 20 was not allowed because it was not clear that the processes it described were implemented by physical components. Claim 20 is now rewritten to make clear that it is not claiming a mental process.

Claim 20 also now emphasizes the importance of the unusual and application specific signal processing function described above, the signal processing function that makes the driver less aware of sounds originating from his own vehicle. Part of this emphasis arises from not

describing the microphones as directionally discriminating microphones. Another reason to eliminate mention of directional microphones is that microphones are inherently directional particularly if they are mounted on the surface of a car. This fact combined with the effect of nearby vehicles reflecting sounds provides adequate directionality to allow the specialized signal processing to reduce unwanted responses to the host vehicle's tire noise.



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